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The effect of length of rest period and length of harvest period on - - - YIELD and SURVIVAL *of* FORAGE CROPS

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SUMMARY

The effect of cutting treatments with rest periods and harvest periods in factorial combinations was studied on several forages in the greenhouse. Experiment I had three rest periods (7, 21 and 42 days) and three harvest periods (1, 7, and 21 days) on six mixtures and three species alone. The nine cutting cycles were imposed for 224 days. Experiment II had 12 cutting treatments, four rest periods (7, 28, 35 and 42 days) and three lengths of harvest period (1, 14, and 28 days) on three varieties of alfalfa (Vernal, Ranger, Buffalo), two varieties of birdsfoot trefoil (Empire, Viking), timothy and orchardgrass. After the differential cutting period of 231 days, all plots of Experiment II were allowed to grow for six weeks and then harvested to measure residual effects of the cutting treatments. The six-week cycle was repeated five times.

The dry matter yield of all forages increased with increasing length of rest period. With a 7-day rest period yield was increased by lengthening the harvest period. With a 42-day rest period, yield decreased with a long harvest period on some species, notably alfalfa. There was a strong interaction of rest period and harvest period in both experiments. With each rest period, alfalfa made the greatest yield when the cutting cycle (rest period plus harvest period) was nearest to six weeks.

The cutting treatments had some effect on stand of most species, but the large differences in yield of dry-matter could not be accounted for by difference in stand.

Three varieties of alfalfa gave the same response to cutting treatments.

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Acknowledgment: The meticulous work necessary for planting and harvesting these experiments was performed by M. Johnsonbaugh and E. H. Junkin.

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ON THE COVER . . . .

Fig. 3.—The appearance of alfalfa under two cutting schedules showing the effect of length of harvest period with a 7-day rest period, experiment II, October 30, 1958.

THE EFFECT OF LENGTH OF REST PERIOD AND LENGTH OF HARVEST PERIOD ON YIELD AND SURVIVAL OF FORAGE CROPS

R. R. DAVIS and J. L. PARSONS

A grazing system is composed of two components; grazing periods and rest or recovery periods. Experiments are seldom designed to study these two components independently. The greenhouse study reported here was designed to measure the effect of rest period, harvest period and their interactions on several forages. It is hoped that the principles uncovered in the greenhouse where grazing is simulated can be applied to practical grazing systems.

Nelson[1] in 1925 reported that alfalfa in Wisconsin gave the largest total dry matter yield when cut twice per year at the full bloom stage. Many experiments since have verified the principle that a forage will yield more dry matter if allowed to become relatively mature before harvesting. Furthermore, the longevity of some plants, notably alfalfa, is adversely affected if cut at an immature stage.

The effect of the period of harvest (grazing or clipping) for a given rest or recovery period is not so clear-cut. Grazing or clipping experiments are usually fixed in a way that the independent effects of the harvest period cannot be measured. Taylor et al.[2] studied the effect of 1, 7 and 14 day removal periods for both clipping and grazing when the herbage reached a height of 8 to 10 inches and 4 to 6 inches. Yields were not significantly different under clipping conditions for the different removal periods. However, under grazing conditions, harvested yields were highest for the 1-day removal period and lowest for the 7- and 14-day periods.

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[1]Nelson, N. T. The effects of frequent cutting on the production, root reserves, and behavior of alfalfa. Jour. Amer. Soc. Agron. 17:100-113, 1925.

[2]Taylor, T. H., J. B. Washko and R. E. Blaser. Dry matter yield and botanical composition of an orchardgrass-Ladino white clover mixture under clipping and grazing conditions. Agron. Jour. 52:217-220, 1960.

EXPERIMENTAL PROCEDURE

The forage crops were grown in raised greenhouse beds having a soil depth of about six inches. The soil was fumigated with methyl bromide at the rate of two pounds per 100 sq. ft. before seeding. The beds were divided into plots 14 by 22 inches by dividing the beds in half lengthwise and by placing cross-strips of sheet metal 14 inches apart (Fig. 3). The plants were seeded in a check design to give 28 hills per plot and later thinned to a single plant per hill. A legume and a grass were seeded in alternate hills when using a mixture. The soil reaction was near neutral and the phosphorus and potassium level was very high before seeding. A 5-20-20 fertilizer was applied at the rate of 400 pounds per acre before seeding and during the test period to insure an adequate fertilizer level. In addition, ammonium nitrate at the rate of 200 pounds per acre was applied to grasses seeded alone when growth symptoms indicated a need for nitrogen.

EXPERIMENT I

Six mixtures (Empire trefoil-bluegrass, Viking trefoil-bluegrass, Ladino clover-bromegrass, Ladino clover-orchardgrass, alfalfa-bromegrass, alfalfa-timothy) and three individual species (Vernal alfalfa, Viking birdsfoot trefoil, Lincoln bromegrass) were seeded in November, 1956. After thinning there were 14 grass plants and 14 legume plants in the plots seeded to mixtures. There were 28 plants in each plot containing only one species. Each mixture or species was seeded in blocks of 10 plots each. There was a border plot between mixtures or species, half of each border being seeded like the plot adjacent to it. Each mixture was replicated four times and individual species were replicated twice. Three lengths of harvest period (1 day, 7 days and 21 days) and three rest periods (7, 21 and 42 days) in factorial were imposed on each mixture and species. Hand shears were used for harvesting. The length of harvest cycle is the sum of harvest period plus rest period in days. Small portions of the forage was clipped at frequent intervals to simulate grazing. The harvest periods are defined as follows:

1-day harvest period—
cut all growth at once to 1 1/2 inch stubble

7-day harvest period—
1st day—cut 1/4 of growth
3rd day—cut 1/3 of remaining growth
5th day—cut 1/2 of remaining growth
7th day—cut all remaining growth to 1 1/2 inch stubble

21-day harvest period—

1st day—cut 1/8 of growth
4th day—cut 1/7 of remaining growth
7th day—cut 1/6 of remaining growth
10th day—cut 1/5 of remaining growth
13th day—cut 1/4 of remaining growth
16th day—cut 1/3 of remaining growth
19th day—cut 1/2 of remaining growth
21st day—cut all remaining growth to 1 1/2 inch stubble

The designated portion of the growth was cut from the top of the entire plot on schedule. The harvest schedules started March 27, 1957 after the alfalfa was blooming, and continued until November 6, a period of 224 days.

EXPERIMENT II

Three varieties of alfalfa (Vernal, Ranger, Rhizoma), two varieties of birdsfoot trefoil (Empire, Viking), timothy and orchardgrass were seeded in December, 1957 in the same greenhouse beds used for Experiment I. The beds were again fumigated, fertilized and divided into 14 by 22 inch plots before seeding. The final stand was 28 plants in each plot. Each crop was seeded in blocks of 12 plots with a border between crops as in Experiment I. There were four replications of the alfalfa and birdsfoot trefoil varieties and two replications of timothy and orchardgrass. Three lengths of harvest period (1-day, 14-days and 28-days) and four rest periods (7, 28, 35 and 42 days) in factorial were imposed on each crop. Hand shears were used to make the cutting treatments. The harvest periods are defined as follows:

1-day harvest period—

cut all growth at once to 2-inch stubble

14-day harvest period—

3rd day—cut 1/6 of growth
5th day—cut 1/5 of remaining growth
7th day—cut 1/4 of remaining growth
9th day—cut 1/3 of remaining growth
11th day—cut 1/2 of remaining growth
14th day—cut all remaining growth to 2-inch stubble

28-day harvest period—

1st day—cut 1/10 of growth
4th day—cut 1/9 of remaining growth
7th day—cut 1/8 of remaining growth
10th day—cut 1/7 of remaining growth

13th day—cut 1/6 of remaining growth
16th day—cut 1/5 of remaining growth
19th day—cut 1/4 of remaining growth
22nd day—cut 1/3 of remaining growth
25th day—cut 1/2 of remaining growth
28th day—cut all remaining growth to 2-inch stubble

As with Experiment I, the designated portion of growth was cut from the top of the entire plot. The differential harvest schedules started April 15, 1958 and ended December 2, 1958 (231 days) when all plots were uniformly cut to a 2-inch stubble.

After terminating the differential cutting treatments, all plots were allowed to grow for six weeks to measure residual effect of the prior cutting treatments on the dry-matter production of the forages. The six-week growth periods, followed by uniform harvesting were continued until the yield was taken following the fifth growth period, June 30, 1959.

RESULTS AND DISCUSSION

The dry matter yield of each forage tested was substantially increased by increasing the length of rest period from 7 to 42 days. The effect of length of harvest period was strongly influenced by rest period,

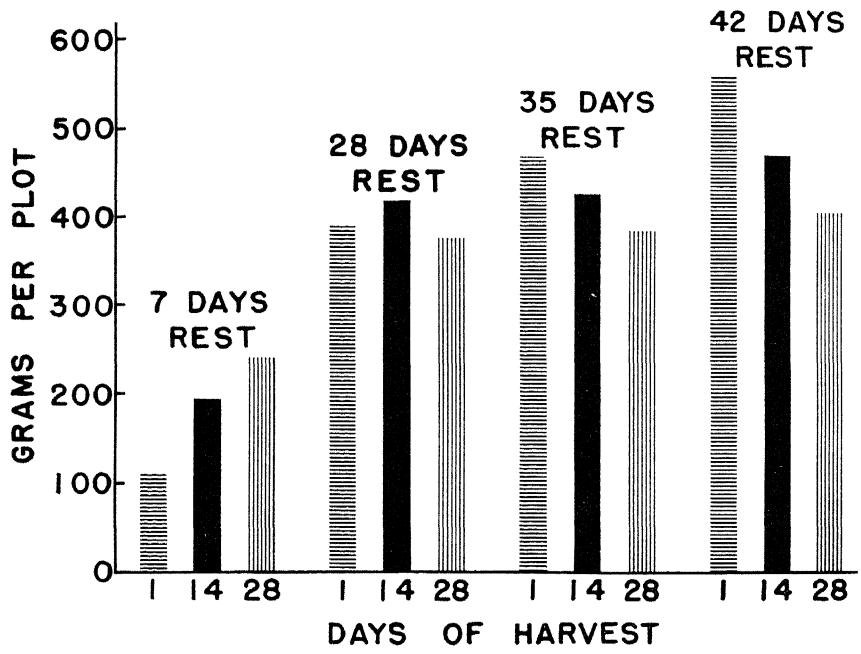

Fig. 1.—The average dry matter yield per plot of three varieties of alfalfa during a 231-day differential cutting period.

making a strong interaction of rest and harvest period. With a 7-day rest period, the yield of all species or mixtures increased with increasing length of harvest period (Figs. 1, 2; Tables I, IV, VI, X). With a 42-day rest period, the response to harvest period ranged from a sharp decrease in alfalfa yield (Fig. 1) with a 28-day harvest period to no effect of harvest period on yield of birdsfoot trefoil-bluegrass mixtures (Table I). The highest yield of alfalfa with any rest period was obtained when the length of the cycle (rest period plus harvest period) was nearest to 42 days. Interactions of mixtures or individual species or varieties with cutting treatments are evident in Tables I, IV and VI.

Some of the yield reduction of alfalfa with a 42-day rest period and a long harvest period can be accounted for by loss of lower leaves before the harvest schedule is completed. Another possible cause of yield reduction, perhaps more important than leaf loss, is the delay after the dry matter accumulation approaches maximum until the harvest schedule is completed and regrowth starts.

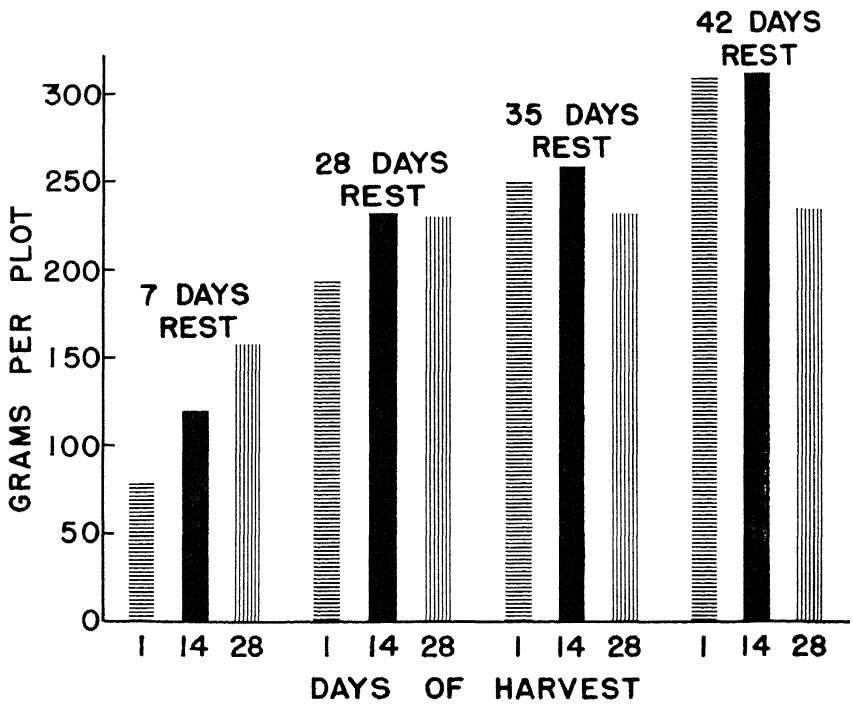

Fig. 2.—The average dry matter yield per plot of two varieties of birdsfoot trefoil during a 231-day differential cutting period.

When the rest period was short, yield was substantially increased by lengthening the harvest period. The buds in the leaf axils of alfalfa made considerable growth during long harvest periods. Many crown buds also developed on alfalfa making numerous fine stems (Fig. 3 cover).

Cutting treatments strongly affected stand of some species and had little or no effect on others (Figs. 4, 5; Tables II, III, V, VII, XI). With a 7-day rest period, a long harvest period favored the survival of most crops. With a longer rest period, length of harvest period had little or no effect on stand. Alfalfa was able to survive with a short cutting cycle. The very large differences in yield of dry-matter due to cutting treatments of alfalfa and birdsfoot trefoil cannot be allied to differences in stand (Figs. 4, 5). There was a serious loss of birdsfoot trefoil from *Rhizoctonia solani*[3] in each experiment. The only other disease noted in the course of the experiments was a light infestation of powdery mildew *(Erysiphe spp.)* on orchardgrass.

[3]Identified by A. F. Schmitthenner, Dept. of Botany and Plant Pathology, Ohio Agricultural Experiment Station.

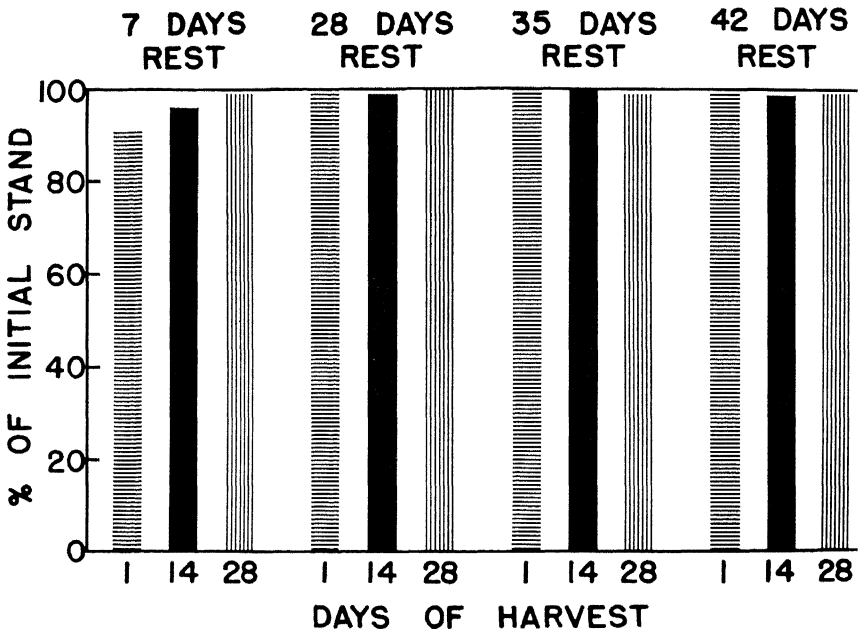

Fig. 4.—The average percent of initial stand of three alfalfa varieties at the end of a 231-day differential cutting period.

The residual effect of the cutting treatments of Experiment II was measured by the yield following six-week growth periods. The dry matter yield following the second and fifth growth periods after terminating the differential cutting treatments are shown in Tables VIII, IX, XII, and XIII. Both rest period and harvest period were still influencing yield of alfalfa after the second six-week growth period. Rest period, but not harvest period, shows a residual effect on yield of alfalfa after the fifth growth period (Fig. 6). There was no residual effect of cutting treatments on the yield of birdsfoot trefoil after the fifth growth period (Fig. 7).

There was no difference in the yield of the three alfalfa varieties (Vernal, Ranger, Rhizoma) which differ widely in habit of growth and genetic make up (Table VI). The three varieties gave the same response to cutting treatments from the standpoint of both yield and stand (Tables VI and VII).

The cutting treatments used in Experiment II are being imposed on small field plots of Vernal alfalfa. If the response to cutting treatments in the field test is similar to greenhouse results, the greenhouse technique can be used with confidence to screen possible grazing management systems for utilizing a forage.

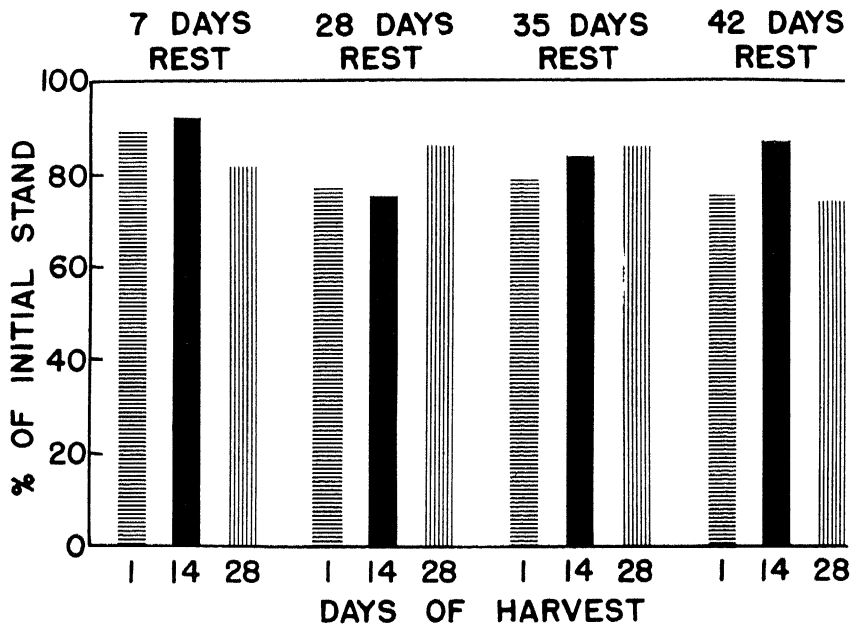

Fig. 5.—The average percent of initial stand of two birdsfoot trefoil varieties at the end of a 231-day differential cutting period.

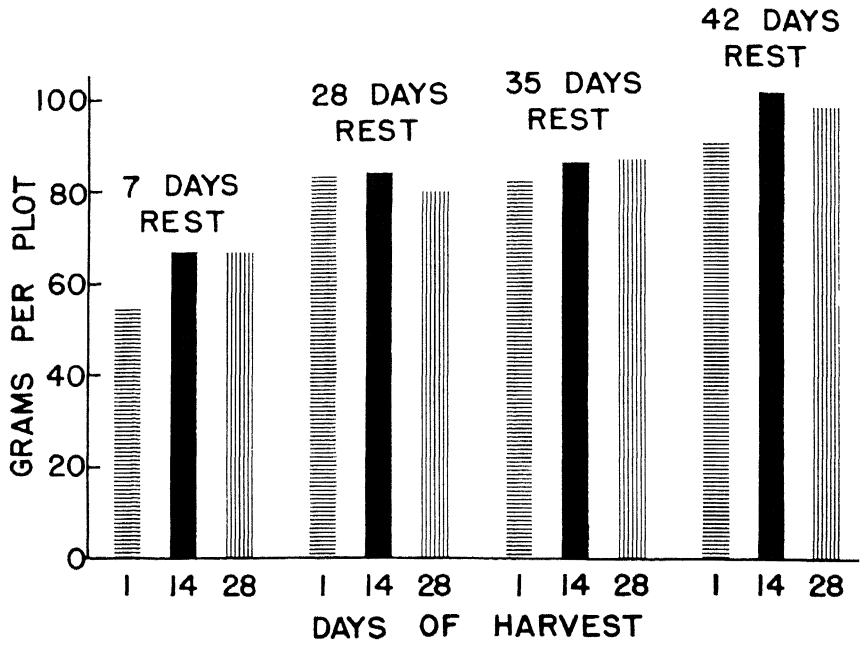

Fig. 6.—The average dry matter yield per plot of three varieties of alfalfa after the fifth uniform six-week growth period following the termination of differential cutting.

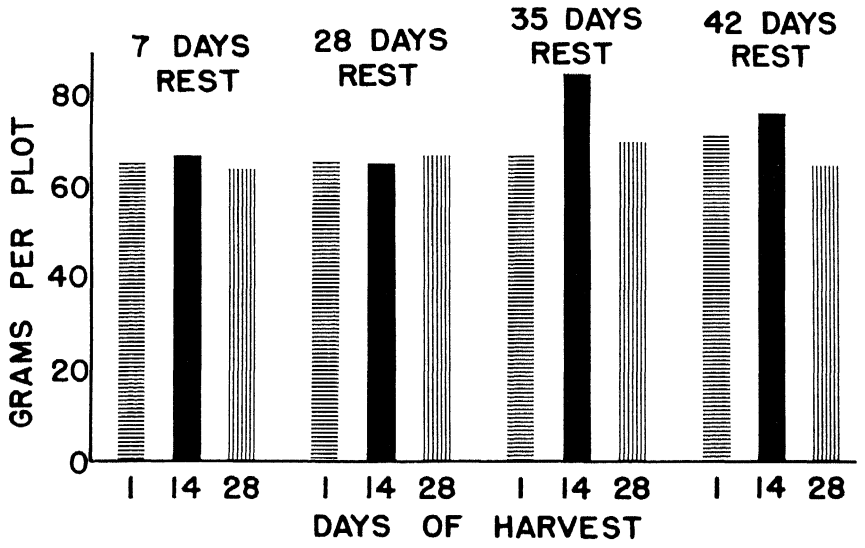

Fig. 7.—The average dry matter yield per plot of two varieties of birdsfoot trefoil after the fifth uniform six-week growth period following the termination of differential cutting.

TABLE I.—The dry matter production per plot from mixtures during the experimental period of 224 days, Experiment I

Mixtures	Rest Period 7 days			Rest Period 21 days			Rest Period 42 days			Average Mixtures
	Harvest period in days			Harvest period in days			Harvest period in days			
	1	7	21	1	7	21	1	7	21	
	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.
Empire trefoil-bluegrass	87	104	128	136	144	169	231	223	233	160
Viking trefoil-bluegrass	95	104	148	150	156	216	277	282	281	190
Ladino-bromegrass	105	130	190	208	208	261	301	305	320	225
Ladino-orchardgrass	102	126	223	208	218	282	326	345	343	241
Alfalfa-bromegrass	88	123	170	260	206	236	373	349	325	237
Alfalfa-timothy	94	114	175	229	209	252	429	422	341	252
Average Rest Periods		128			208			317		
Average Harvest Periods	1 day—**206**			7 days—**209**			21 days—**238**			

	Mixture	Rest Period	Harvest Period	Rest × Harvest
LSD 5 %	22	12	10	15
1 %	31	16	13	20
C. V.	20 %	16 %	13 %	12 %

Other significant interactions—Mixture × Rest period, Mixture × Harvest period and Mixture × Rest period × Harvest period.

TABLE II.—The percent of initial legume stand remaining after a 224 day differential cutting period, Experiment I

Mixtures	Rest Period 7 days			Rest Period 21 days			Rest Period 42 days			Average Mixtures
	Harvest period in days			Harvest period in days			Harvest period in days			
	1	7	21	1	7	21	1	7	21	
	%	%	%	%	%	%	%	%	%	%
Empire trefoil-bluegrass	59	66	63	70	86	75	77	80	68	72
Viking trefoil-bluegrass	23	14	34	23	44	54	71	77	57	44
Ladino-bromegrass	79	77	94	75	96	94	86	93	84	87
Ladino-orchardgrass	73	80	86	75	92	86	87	96	92	85
Alfalfa-bromegrass	51	56	91	100	93	99	93	99	100	87
Alfalfa-timothy	70	84	99	100	100	99	100	100	94	94
Average Rest Periods		66			82			86		
Average Harvest Periods	1 day—**74**			7 days—**79**			21 days—**82**			

	Mixtures	Rest Periods	Harvest Periods	Rest × Harvest
LSD 5 %	19	6	4	7
1 %	26	8	6	10

Other significant interactions—Mixture × Rest.

TABLE III.—The percent of initial grass stand remaining after a 224 day differential cutting period, Experiment I

Mixtures	Rest Period 7 days			Rest Period 21 days			Rest Period 42 days			Average Mixtures
	Harvest period in days			Harvest period in days			Harvest period in days			
	1	7	21	1	7	21	1	7	21	
	%	%	%	%	%	%	%	%	%	%
Empire trefoil-bluegrass	99	100	100	100	100	100	100	100	100	100
Viking trefoil-bluegrass	100	100	100	100	100	100	100	100	100	100
Ladino-bromegrass	89	93	96	91	96	100	78	92	96	92
Ladino-orchardgrass	92	93	100	96	93	100	96	100	100	97
Alfalfa-bromegrass	93	94	93	92	99	100	87	99	94	94
Alfalfa-timothy	40	59	80	59	54	84	70	87	89	69
Average Rest Periods		90			92			97		
Average Harvest Periods	1 day—**88**			7 days—**92**			21 days—**97**			

	Mixtures	Rest Period	Harvest Period	Rest × Harvest
LSD 5 %	7	N.S.	4	N.S.
1 %	9	N.S.	4	N.S.

Other significant interactions—Mixture × Harvest and Mixture × Rest × Harvest.

TABLE IV.—The dry matter production per plot from species seeded alone during the experimental period of 224 days, Experiment 1

Species	Rest Period 7 days			Rest Period 21 days			Rest Period 42 days			Average Species
	Harvest period in days			Harvest period in days			Harvest period in days			
	1	7	21	1	7	21	1	7	21	
	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.
Viking trefoil	77	95	121	118	202	222	341	282	296	195
Vernal alfalfa	126	130	218	223	260	276	502	397	408	282
Lincoln bromegrass	144	123	209	196	196	243	284	296	254	216
Average Rest Periods		138			215			340		
Average Harvest Periods	1 day—**223**			7 days—**220**			21 days—**250**			

	Species	Rest	Harvest	Rest × Harvest
LSD 5 %	N.S.	27	15	24
1 %	N.S.	41	22	34
C. V.	27 %	14 %	8 %	8 %

Other significant interactions—Species × Rest and Species × Harvest × Rest.

TABLE V.—The percent of initial stand remaining after a 224 day differential cutting period, Experiment I

Species	Rest Period 7 days			Rest Period 21 days			Rest Period 42 days			Average Species
	Harvest period in days			Harvest period in days			Harvest period in days			
	1	7	21	1	7	21	1	7	21	
	%	%	%	%	%	%	%	%	%	%
Viking trefoil	9	20	43	50	82	93	89	66	82	60
Vernal alfalfa	57	66	96	91	100	100	100	100	98	90
Lincoln bromegrass	84	95	100	95	100	100	96	93	93	95
Average Rest Periods		64			90			91		
Average Harvest Periods	1 day—**75**			7 days—**81**			21 days—**90**			

	Species	Rest	Harvest	Rest × Harvest
LSD 5%	N.S.	10	6	15
1%	N.S.	24	9	N.S.

TABLE VI.—The dry matter production per plot from alfalfa and birdsfoot trefoil during the differential cutting period of 231 days, Experiment II

Variety	Rest Period 7 days			Rest Period 28 days			Rest Period 35 days			Rest Period 42 days			Average Variety
	Harvest period in days			Harvest period in days			Harvest period in days			Harvest period in days			
	1	14	28	1	14	28	1	14	28	1	14	28	
	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.
Vernal alfalfa	102	205	256	382	436	373	483	386	394	579	464	459	376
Ranger alfalfa	122	179	221	425	391	366	477	478	368	546	488	388	371
Rhizoma alfalfa	114	202	248	367	426	392	444	412	389	557	458	370	365
Average Rest Periods		183			395			426			479		
Average Harvest Periods	1 day—**383**			14 days—**377**			28 days—**352**						
Viking trefoil	83	138	196	222	292	243	300	296	268	358	335	256	249
Empire trefoil	76	100	118	167	172	218	202	222	195	262	288	214	186
Average Rest Periods		118			219			247			286		
Average Harvest Periods	1 day—**209**			14 days—**230**			28 days—**214**						

		Variety	Rest	Harvest	Rest × Harvest
LSD Alfalfa	5%	N.S.	27	24	48
	1%	N.S.	37	N.S.	63
	C.V.	12%	16%	16%	16%
LSD Trefoil	5%	46	12	11	21
	1%	N.S.	16	14	28
	C.V.	32%	10%	10%	10%

Other significant interactions—(trefoil)—Variety × Rest and Variety × Rest × Harvest.

TABLE VII.—The percent of initial stand of alfalfa and birdsfoot trefoil remaining after a 231-day differential cutting period, Experiment II

Variety	Rest Period 7 days			Rest Period 28 days			Rest Period 35 days			Rest Period 42 days			Average Variety
	Harvest period in days			Harvest period in days			Harvest period in days			Harvest period in days			
	1	14	28	1	14	28	1	14	28	1	14	28	
	%	%	%	%	%	%	%	%	%	%	%	%	%
Vernal alfalfa	92	96	100	96	100	100	100	100	100	100	99	100	99
Ranger alfalfa	88	96	100	100	100	100	100	99	100	100	100	99	99
Rhizoma alfalfa	93	95	97	100	97	100	99	100	96	97	99	97	97
Average Rest Periods		95			99			99			99		
Average Harvest Periods	1 day—**97**			14 days—**98**			28 days—**99**						
Viking trefoil	88	94	96	75	89	92	86	94	93	76	86	77	87
Empire trefoil	89	91	70	82	66	83	75	77	82	80	87	77	78
Average Rest Periods		88			80			83			80		
Average Harvest Periods	1 day—**80**			14 days—**85**			28 days—**82**						

		Variety	Rest	Harvest	Rest × Harvest
LSD Alfalfa	5 %	N.S.	1	1	2
	1 %	N.S.	2	1	3
LSD Trefoil	5 %	9	N.S.	N.S.	N.S.
	1 %	N.S.	N.S.	N.S.	N.S.

TABLE VIII.—The yield of dry matter per plot from alfalfa and birdsfoot trefoil after the second uniform six-week growth period, February 24, 1959, Experiment II

Variety	Rest Period 7 days			Rest Period 28 days			Rest Period 35 days			Rest Period 42 days			Average Variety
	Harvest period in days			Harvest period in days			Harvest period in days			Harvest period in days			
	1	14	28	1	14	28	1	14	28	1	14	28	
	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.
Vernal alfalfa	9	15	16	17	20	22	22	18	26	23	28	25	20
Ranger alfalfa	10	10	12	21	22	22	22	27	22	26	36	27	21
Rhizoma alfalfa	10	14	16	20	22	22	22	24	24	26	28	30	21
Average Rest Periods		12			21			23			27		
Average Harvest Periods		1 day—**19**			14 days—**22**			28 days—**22**					
Viking trefoil	12	12	13	9	14	14	15	14	14	12	16	14	13
Empire trefoil	8	7	8	9	8	12	12	10	10	9	10	9	9
Average Rest Periods		10			11			12			12		
Average Harvest Periods		1 day—**11**			14 days—**11**			28 days—**11**					

		Variety	Rest	Harvest	Rest × Harvest	
LSD Alfalfa	5 %	N.S.	2	2	N.S.	
	1 %	N.S.	3	2	N.S.	Other significant interaction
	C.V.	34 %	20 %	20 %	20 %	(Alfalfa)—Variety × Rest × Harvest.
LSD Trefoil	5 %	3	1	N.S.	2	
	1 %	N.S.	1	N.S.	2	Other significant interactions
	C.V.	35 %	15 %	15 %	15 %	(Trefoil)—Variety × Harvest and Variety × Rest × Harvest.

TABLE IX.—The yield of dry matter per plot from alfalfa and birdsfoot trefoil after the fifth uniform six-week growth period, June 30, 1959, Experiment II

Variety	Rest Period 7 days			Rest Period 28 days			Rest Period 35 days			Rest Period 42 days			Average Variety
	Harvest period in days			Harvest period in days			Harvest period in days			Harvest period in days			
	1	14	28	1	14	28	1	14	28	1	14	28	
	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.
Vernal alfalfa	48	76	62	88	77	83	88	84	86	88	98	92	81
Ranger alfalfa	61	54	69	85	88	81	80	94	89	98	122	102	85
Rhizoma alfalfa	56	70	69	80	84	77	81	81	87	90	87	102	80
Average Rest Periods		63			83			86			98		
Average Harvest Periods	1 day—**79**			14 days—**85**			28 days—**83**						
Viking trefoil	75	74	79	72	80	61	79	92	82	71	88	69	77
Empire trefoil	54	60	49	58	51	72	55	74	57	72	64	61	61
Average Rest Periods		65			66			73			71		
Average Harvest Periods	1 day—**67**			14 days—**73**			28 days—**66**						

		Variety	Rest	Harvest	Rest × Harvest
LSD Alfalfa	5 %	N.S.	7	N.S.	N.S.
	1 %	N.S.	9	N.S.	N.S.
	C.V.	35 %	18 %	18 %	18 %
LSD Trefoil	5 %	10	N.S.	N.S.	N.S.
	1 %	N.S.	N.S.	N.S.	N.S.
	C.V.	22 %	20 %	20 %	20 %

TABLE X.—The dry matter production per plot from timothy and orchardgrass during the differential cutting period of 231 days, Experiment II

Species	Rest Period 7 days			Rest Period 28 days			Rest Period 35 days			Rest Period 42 days			Average Species
	Harvest period in days			Harvest period in days			Harvest period in days			Harvest period in days			
	1	14	28	1	14	28	1	14	28	1	14	28	
	g.	g.	g.	g.	g.	g.	g	g.	g.	g.	g.	g.	g.
Timothy	78	140	227	176	235	247	280	230	275	360	326	322	241
Orchardgrass	102	184	267	282	370	336	308	275	272	331	396	343	289
Average Rest Periods		166			274			273			347		
Average Harvest Periods	1 day—**240**			14 days—**270**			28 days—**286**						

	Species	Rest	Harvest	Rest × Harvest
LSD 5 %	N.S.	40	35	70
1 %	N.S.	55	N.S.	N.S.
C. V	23 %	18 %	18 %	18 %

TABLE XI.—The percent of initial stand of timothy and orchardgrass remaining after a 231-day differential cutting period, Experiment II

Species	Rest Period 7 days			Rest Period 28 days			Rest Period 35 days			Rest Period 42 days			Average Species
	Harvest period in days			Harvest period in days			Harvest period in days			Harvest period in days			
	1	14	28	1	14	28	1	14	28	1	14	28	
	%	%	%	%	%	%	%	%	%	%	%	%	%
Timothy	59	80	91	54	91	89	82	91	68	96	91	88	82
Orchardgrass	82	91	100	98	93	98	98	100	100	80	91	100	94
Average Rest Periods		84			87			90			91		
Average Harvest Periods	1 day—**82**			14 days—**91**			28 days—**92**						

	Species	Rest	Harvest	Rest × Harvest
LSD 5 %	6	5	5	9
1 %	N.S.	N.S.	6	12

TABLE XII.—The yield of dry matter per plot from timothy and orchardgrass after the second uniform six-week growth period, February 23, 1959, Experiment II

Species	Rest Period 7 days			Rest Period 28 days			Rest Period 35 days			Rest Period 42 days			Average Species
	Harvest period in days			Harvest period in days			Harvest period in days			Harvest period in days			
	1	14	28	1	14	28	1	14	28	1	14	28	
	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.
Timothy	8	18	18	10	18	18	20	20	8	22	11	10	15
Orchardgrass	14	21	23	28	32	29	18	24	26	16	35	24	24
Average Rest Periods		17			23			19			19		
Average Harvest Periods	1 day—**17**			14 days—**22**			28 days—**19**						

	Species	Rest	Harvest	Rest × Harvest	
					Other significant interactions
LSD 5 %	N.S.	2	2	4	Species × Rest
1 %	N.S.	3	3	5	Species × Harvest
C. V.	30 %	12 %	12 %	12 %	Species × Rest × Harvest

TABLE XIII.—The yield of dry matter per plot from timothy and orchardgrass after the fifth uniform six-week growth period, June 29, 1959, Experiment II

Species	Rest Period 7 days			Rest Period 28 days			Rest Period 35 days			Rest Period 42 days			Average Species
	Harvest period in days			Harvest period in days			Harvest period in days			Harvest period in days			
	1	14	28	1	14	28	1	14	28	1	14	28	
	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.
Timothy	16	14	19	12	12	10	16	17	12	18	12	12	14
Orchardgrass	14	14	19	22	20	14	18	19	18	18	24	18	18
Average Rest Periods		16			15			16			17		
Average Harvest Periods	1 day—**17**			14 days—**17**			28 days—**15**						

	Species	Rest	Harvest	Rest × Harvest
LSD 5 %	3	N.S.	N.S.	Sig.
1 %	N.S.	N.S.	N.S.	N.S.
C. V.	5 %	17 %	17 %	17 %